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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/856,460

Applicant(s)

LESCUYER ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-7, 9 and 11 are pending.

Claim Rejections - 35 USC § 112

Applicant's cancellation of claim 8 and amending claim 9 has overcome this rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1,2,4, 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pryor (US 4,413,813) in view of JP 07-016698 A. and Robyn et al (US 5,229,337).

Claim 1: Pryor teaches a method for filtering liquid metal comprising passing through a bed of refractory materials like alumina (abstract, figures, col 3 lines 36-46). Pryor does not teach the open porosity of the refractory material. JP teaches the open porosity (given as apparent porosity, apparent porosity is same as open porosity. *The apparent porosity of a body is the ratio of the volume of the open pores to the bulk volume of the body* – see ref Robyn, col 8 lines 43-47, for the definition of apparent porosity; the body in this case is the ceramic particle) of refractory particles used in molten metal processing as $\leq 20\%$ (see English abstract). It would be obvious to one of

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ordinary skill in the art at the time of invention to use the teaching of JP in the teaching of Pryor because Pryor also teaches selecting the material for the media for repeat use (col 5 lines 37-43), and the JP teaching of particles having high resistance 'over destruction by heating or wear' for repeat use (see para 0010 - 0012) would be good for repeat use as taught by Pryor.

Claim 6: liquid metal is aluminum, etc: Pryor teaches the process as generic for all molten metals. Molten aluminum is taught in col 1 lines 55-64.

Claim 2: Pryor in view of JP and Robyn do not teach the residence time of the liquid metal in the bed. However, residence time is a variable depending on the metal to be filtered, its impurity content and the bed material capacity, and therefore, can be optimized. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955).

Claim 4: particle size from 0.2-2 mm is taught by Pryor col 4 lines 5-10. Bed thickness, like the residence time, will depend on the molten metal, its impurity content and the bed capacity, and can be optimized – In re Boesch, etc.

Claim 9: Pryor teaches a filtration device for liquid metal having a bed of refractory particles, but does not teach the particles as having open porosity between 5 and 30%. JP teaches the open porosity (given as apparent porosity; apparent porosity is same as open porosity – see ref Robyn, col 8 lines 43-47, for the definition of apparent porosity) of refractory particles used in molten metal processing as $\leq 20\%$ (see

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English abstract). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of JP in the teaching of Pryor because JP teaches particles having high resistance 'over destruction by heating or wear' (see para 0011 and 0012), which would be good for repeat use as taught by Pryor (col 5 lines 37-43).

2. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pryor (US 4,413,813) in view of JP 07-016698 A and Robyn et al (US 5,229,337) as in claim 1 above and further in view of Brezny (US 5,322,821).

Instant claims add the further limitation of pore diameters, which Pryor in view of JP and Robyn does not teach. Brezny teaches refractory metal particles for filtering molten metals having pore sizes from 0.01 – 200 microns. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Brezny in the teaching of Pryor in view of JP and Robyn because Pryor in view of JP and Robyn does not specify the pore sizes, and because Brezny provides improved surface area and interconnected pores for improved capacity (see Brezny col 2 lines 8-47).

3. Claims 1,4,5,7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al (US 3,172,757 in view of Neidhardt et al (US 4,177,235).

Claims 1: Hess teaches a process of filtering a molten metal using a bed of refractory particulates - see figures, col 2 lines 40-54. Hess does not teach the porosity of the particles in the bed. Neidhardt teaches corundum made by the same method as that of the applicant, and therefore, inherently would have the same porosity, as in claim

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8 above. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Hess to have pure α corundum for higher melting point and crush resistance as required by Hess (col 2 lines 40-45).

Claim 4: Hess teaches particle size 6-20 mm ($\frac{1}{4}$ - $\frac{3}{4}$ in. see col 3 lines 64-68), and bed thickness as about 5 in, which falls in the range claimed (col 6 lines 1-10).

Claim 5: particles are corundum – see col 2 lines 44-47.

Claim 7: method of making the corundum particles is taught by Neidhardt – see abstract and col 3 line 27 – col 4 line 33.

Claim 9: Hess teaches a filtration device for liquid metal having corundum (col 2 lines 40-54, figures), but does not teach the porosity of the corundum. Neidhardt teaches corundum made by the same method as that of the applicant, and therefore, inherently would have the same porosity. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Hess to have pure α corundum for higher melting point and crush resistance as required by Hess (col 2 lines 40-45) in the selection of the material for the media. [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Response to Arguments

Applicant's arguments filed 9/22/04 have been fully considered but they are not persuasive.

In response to the argument that Robyn et al does not suggest the open porosity of the grains of the Japanese patent will be $\leq 20\%$, Robyn defines apparent porosity as *"The apparent porosity of a body is the ratio of the volume of the open pores to the bulk volume of the body, and the true porosity is the ratio of the total volume of the open pores and the closed pores to that bulk volume."* Applicant construes "body" as "... silicon and aluminum particles ... welded together to form a porous refractory weld mass" from the paragraphs bridging columns 9 and 10 of the Robyn ref., which is just trying to spin the fact. Robyn ref is used to relate "apparent porosity" to "open porosity", and that is the only purpose of the Robyn ref in the rejection. Applicants' argument that Robyn defines the apparent porosity for a different type of body is irrelevant and immaterial.

In response to the applicants' argument that the Japanese ref does not disclose filtration of molten metal, that it is not related to filtration, and that there is no reason why one of ordinary skill in the art would consider these references: the Japanese ref is used for refractory particles having 5-30% open porosity. The Japanese ref teaches $\leq 20\%$ apparent porosity; and apparent porosity is shown as the same as open porosity by using the Robyn ref. Japanese ref teaches the refractory particles in the realm of processing molten metals, and is therefore analogous art. Japanese ref teaches the refractory particles as having high resistance to 'destruction by heating or wear' for

repeated use. The Pryor ref teaches repeat using of the refractory, and repeat using would be a good motivation for one to combine the references.

In response to the applicants' argument that no evidence was presented that electrofused corundum inherently has a porosity as presently claimed: Applicants use corundum in their invention and have the same method for making the corundum as in the reference. Therefore, since it is the same material and made by the same method, it would have inherently the same characteristics. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims. In their response, the Applicants have not rebutted the position of the office action that the material and the process are the same and therefore the material would have inherently the same characteristics. The applicant has not proved that their process is sufficiently different that it would make a structurally different product than, and which difference is unobvious to, what is presented in the reference. [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

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Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

In response to the applicants' argument,

"Moreover, even assuming arguendo that the corundum disclosed by Neidhardt et al had such a porosity, there is no disclosure or suggestion that utilizing such a material for filtering molten metal improves the rate of removal of inclusions while reducing the residence time. These improvements have been established in the examples of the present specification in a manner sufficient to rebut any case of prima facie obviousness which is alleged to have been established by these references."

the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, the office action clearly states the motivation to combine the references in the rejection, and such motivation does not have to be what the applicant intended.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon
Patent Examiner


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